What is claimed:

1. A method for extending the life span of a subject comprising administering an inhibitor of histone deacetylase to the subject in an amount effective to extend the life span.

2. The method of claim 1, wherein the inhibitor of histone deacetylase is a butyric acid derivative.

3. The method of claim 2, wherein the butyric acid derivative is selected from the group consisting of isobutyramide, monobutyrin, tributyrin, 2-phenylbutyric acid, 3-phenylbutyric acid, 4-phenylbutyric acid (PBA), phenylacetic acid, cinnamic acid, alpha-methyldihydrocinnamic acid, 3-chloropropionic acid and vinyl acetic acid.

4. The method of claim 3, wherein the butyric acid derivative is soluble.

5. The method of claim 3, wherein the butyric acid derivative is a salt.

6. The method of claim 1, wherein the inhibitor of histone deacetylase is PBA and PBA is a salt.

7. The method of claim 1, wherein the subject is a mutant subject.

8. The method of claim 1, wherein the subject is a Drosophila.

9. The method of claim 8, wherein the Drosophila is a Drosophila melanogaster.

10. The method of claim 9, wherein the Drosophila melanogaster is w^{1118}.

11. The method of claim 8, wherein the Drosophila is a mutant Drosophila.

12. A method for identifying a molecular alteration in a subject comprising:

a. administering an inhibitor of histone deacetylase to the subject; and

b. identifying molecular alterations in the subject caused by said inhibitor of histone deacetylase by comparing the presence, level, and/or modification of nucleic acid and/or protein in the subject with the presence, level, and/or modification of nucleic acid and/or protein in a second subject that has not been administered an inhibitor of histone deacetylase, thereby indicative that the inhibitor of histone deacetylase induces a molecular alteration.

13. A method for identifying a test molecule that induces a molecular alteration in a subject, to which an inhibitor of histone deacetylase has been administered comprising:

a. administering a test molecule to the subject; and

b. identifying molecular alterations in the subject caused by said test molecule by comparing the presence, level, and/or modification of nucleic acid and/or protein in the subject with the presence, level, and/or modification of nucleic acid and/or protein in a second subject that has been administered an inhibitor of histone deacetylase, but was not administered with the test molecule, a difference in the presence, level, and/or modification of nucleic acid and/or protein thereby indicative that the test molecule induces a molecular alteration.

14. A method for identifying a molecule that extends the life span of a subject, wherein the subject has an extended life comprising:

a. administering a test molecule to the subject, to which an inhibitor of histone deacetylase has been administered;

b. comparing the life span of the subject of a) with a second subject, that has been administered an inhibitor of histone deacetylase and not administered the test molecule, a further extended life span by the subject of a) thereby identifies a molecule that extend the life span of the subject.

15. The method of claim 12 or 13, wherein the nucleic acid is a DNA or RNA.

16. The method of claim 15 wherein RNA is mRNA.

17. The method of claim 16, wherein the mRNA encodes a molecule selected from the group consisting of cytochrome P450, glutathione S-transferase 1-1, superoxide dismutase, transcription initiation factor TFIID 85kDa subunit, hepatocalcinoma-related transcription factor, daughterless protein, translation elongation factor 1alpha, translation initiation factor 4 gamma, ribosomal protein L9, ribosomal protein L10A, ribosomal protein L21, ribosomal protein S8, ribosomal protein S9, ribosomal protein S12, ribosomal protein S15A, ribosomal , protein S24, ribosomal protein S29, ribosomal protein P0, ribosomal protein P2, hsc70, hsp60, dnaJ like2, angiotensine-converting enzyme-like protein, aminopeptidase, aminopeptidase N, serine protease, serine protease, serine proteinase 2, angiotensine-converting enzyme precursor, stubble, serine proteinase, cysteine proteinase 1, leucine aminopeptidase, trypsin theta precursor, growth factor-regulated tyrosine , kinase substrate, guanine nucleotide-binding protein alpha, inactivation-no-afterpotential D, beta Adaptin (a), component of HA1 clathrin adaptor, guanyl-nucleotide exchange factor, epididymal secretory protein, SH2-SH3 adaptor protein, phosphorylase kinase gamma, p70-protein kinase(S6K), Fak like tyrosine kinase, Fps oncogene kinase, ADP/ATP translocase, mitochondrial phosphate carrier, sodium-dicarboxylate cotransporter, protein transport protein Sec23, neurotransmitter transporter, ADP/ATP translocase, transferrin precursor, putative odorant-binding protein A5 precursor, transportin, 26S proteasome subunit 4 ATPase, oxysterol-binding protein homolog Calphotin, T1/ST2 receptor binding protein precursor male specific protein, Neurocalcin homolog, ninaC, putative arginine-aspartate-rich RNA binding protein, TAR-binding protein, RNA binding protein, kurz protein, galactose-1-phosphate uridylyltransferase, mitochondrial aldehyde dehydrogenase, pyruvate kinase, aldehyde dehydrogenase 7, succinic semialdehyde dehydrogenase, citrate synthase, succinyl-CoA synthetase alpha subunit, dihydrolipoamide S-succinyltransferase, malate dehydrogenase, aspartate aminotransferase, serine-pyruvate aminotransferase 3-hydroxyisobutyrate

dehydrogenase, 4-hydroxyphenylpyruvate dioxygenase, 4-amino butyrate amino transferase, haloacid dehalogenase-like hydrolase, phospholipase C, hydroxymethylglutaryl-CoA synthase, alpha esterase, 1-acyl-glycerol-3-phosphate acyltransferase, fatty acid desaturase, amidophosphoribosylamidotransferase, ATP synthase subunit g, ATP synthase subunit, vacuolar ATP, synthase subunit, Rho small GTPase, hook, myosin heavy chain, p47 protein, metasis-associated1-like protein, protein involved in sexual development, Cdc37, cell division cycle 37 protein, X-linked nuclear protein, microsomal epoxide hydrolase, imaginal disc growth factor 1, 18s rRNA, vitellogenin receptor, cystein proteinase 1, proteasome subunit, leucine aminopeptidase, mitochondrial processing protease-beta, ubiquitin conjugating enzyme, ribosomal protein S26, stubarista, ribosomal protein, dnaJ – 1, guanine, nucleotide-binding protein gamma subunit, peroxisomal farnesylated protein, midline fasciclin precursor, hexokinase, glyceraldehyde 3phosphate dehydrogenase 1, ATP synthase, subunit d, phosphogluconate, dehydrogenase, isocitrate dehydrogenase, aconitate hydratase precursor, acetyl-CoA carboxylase, hydroxyacyl-CoA dehydrogenase, NAD-dependent 15-hydroxyprostaglandin dehydrogenase, fatty acid synthase, choline acetyltransferase, peptidyl gycine-alpha-hydroxylating monooxygenase, gamma-glutamylcysteine synthetase, tyrosine 3-monoxygenase, alpha-esterase, ATP synthase gamma, antennal-specific short-chain dehydrogenase/reductase, NADH:ubiquinone reductase 75kD subunit precursor, rhophilin, cytochrome c oxidase subunit Vib, cytochrome c oxidase, syntaxin, inorganic phosphate, cotransporter, tropomycine T, transferrin precursor, pheromone binding protein related protein 1 precursor, calreticulin, RNA helicase, osa, Cdk9, Mst87F, structural sperm protein, Transmembrane 4 Super Family, beta-spectrin, cut up, synaptogyrin homolog, tryptophanyl-tRNA synthetase, porin, and a voltage dependent anion-selective channel.

18. The method of claim 12 or 13, wherein the protein so modified is acetylated.

19 The method of claim 18, wherein the acetylated protein is a histone.

20. The method of claim 19, wherein the histone is methylated.

21. The method of claim 19, wherein the histone is H3.

22. The method of claim 19, wherein the histone is H4.